

WHAT IS CLAIMED IS:

1. A magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, comprising:

formatting means for adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and for formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

supply means for supplying the data formatted by said formatting means to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting means continuously disposes 139 sync blocks on each of said tracks, each of said 139 sync blocks having 111 bytes;

among said 139 sync blocks, 121 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the

three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 139 sync blocks obtained by dividing 2224 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 139 sync blocks obtained by dividing 1668 sync blocks contained in twelve tracks by twelve planes, or for each group of the 139 sync blocks obtained by dividing 1112 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

2. A magnetic tape recording apparatus according to claim 1, wherein the video data is high definition video data compressed by an MP@HL or MP@H-14 method.

3. A magnetic tape recording method for use in a magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, said magnetic tape recording method comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data

related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 139 sync blocks on each of said tracks, each of said 139 sync blocks having 111 bytes;

among said 139 sync blocks, 121 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 139 sync blocks obtained by dividing 2224 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 139 sync blocks obtained by dividing 1668 sync blocks contained in twelve tracks by twelve planes, or

for each group of the 139 sync blocks obtained by dividing 1112 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

4. A recording medium for storing a computer readable program for allowing a magnetic tape recording apparatus to record digital data on tracks of a magnetic tape by using a rotary head, said computer readable program comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 139 sync blocks on each of said tracks, each of said 139 sync blocks having 111 bytes;

among said 139 sync blocks, 121 sync blocks each consist of a two-byte detection pattern for detecting the

sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 139 sync blocks obtained by dividing 2224 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 139 sync blocks obtained by dividing 1668 sync blocks contained in twelve tracks by twelve planes, or for each group of the 139 sync blocks obtained by dividing 1112 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

5. A format of a magnetic tape having tracks on which digital data is recorded by using a rotary head, comprising error correcting code added to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, said first group data and said second group data

being formatted so that they are continuously disposed on the tracks of said magnetic tape, wherein:

139 sync blocks, each of said 139 sync blocks having 111 bytes, are disposed on each of said tracks;

among said 139 sync blocks, 121 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 139 sync blocks obtained by dividing 2224 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 139 sync blocks obtained by dividing 1668 sync blocks contained in twelve tracks by twelve planes, or for each group of the 139 sync blocks obtained by dividing 1112 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

6. A magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, comprising:

formatting means for adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and for formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

supply means for supplying the data formatted by said formatting means to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting means continuously disposes 141 sync blocks on each of said tracks, each of said 141 sync blocks having 111 bytes;

among said 141 sync blocks, 123 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting

code; and

said outer error correcting code is provided for each group of the 141 sync blocks obtained by dividing 2256 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 141 sync blocks obtained by dividing 1692 sync blocks contained in twelve tracks by twelve planes, or for each group of 141 sync blocks obtained by dividing 1128 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

7. A magnetic tape recording apparatus according to claim 6, wherein the video data is high definition video data compressed by an MP@HL or MP@H-14 method.

8. A magnetic tape recording method for use in a magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, said magnetic tape recording method comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are



continuously disposed on the tracks of said magnetic tape;  
and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 141 sync blocks on each of said tracks, each of said 141 sync blocks having 111 bytes;

among said 141 sync blocks, 123 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 141 sync blocks obtained by dividing 2256 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 141 sync blocks obtained by dividing 1692 sync blocks contained in twelve tracks by twelve planes, or for each group of 141 sync blocks obtained by dividing 1128 sync blocks contained in eight tracks by eight planes, and

said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

9. A recording medium for storing a computer readable program which allows a magnetic tape recording apparatus to record digital data on tracks of a magnetic tape by using a rotary head, said computer readable program comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 141 sync blocks on each of said tracks, each of said 141 sync blocks having 111 bytes;

among said 141 sync blocks, 123 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte

inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 141 sync blocks obtained by dividing 2256 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 141 sync blocks obtained by dividing 1692 sync blocks contained in twelve tracks by twelve planes, or for each group of 141 sync blocks obtained by dividing 1128 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

10. A format of a magnetic tape having tracks on which digital data is recorded by using a rotary head, comprising error correcting code added to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, said first group data and said second group data being formatted so that they are continuously disposed on the tracks of said magnetic tape, wherein:

said 141 sync blocks, each of said 141 sync blocks having 111 bytes, are continuously disposed on each of said tracks;

among said 141 sync blocks, 123 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 96-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 18 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 96-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 141 sync blocks obtained by dividing 2256 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 141 sync blocks obtained by dividing 1692 sync blocks contained in twelve tracks by twelve planes, or for each group of the 141 sync blocks obtained by dividing 1128 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

11. A magnetic tape recording apparatus for recording

digital data on tracks of a magnetic tape by using a rotary head, comprising:

formatting means for adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and for formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

supply means for supplying the data formatted by said formatting means to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting means continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 99-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 99-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

12. A magnetic tape recording apparatus according to claim 11, wherein the video data is high definition video data compressed by an MP@HL or MP@H-14 method.

13. A magnetic tape recording method for use in a magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, said magnetic tape recording method comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape;

and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 99-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 99-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that

the distance between the sync blocks belonging to the identical plane is constant among the planes.

14. A recording medium for storing a computer readable program which allows a magnetic tape recording apparatus to record digital data on tracks of a magnetic tape by using a rotary head, said computer readable program comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 99-byte main data, and 10-byte inner error correcting code added to said identification



information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 99-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of the 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

15. A format of a magnetic tape having tracks on which digital data is recorded by using a rotary head, comprising error correcting code added to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, said first group data and said second group data being formatted so that they are continuously disposed on the tracks of said magnetic tape, wherein:

135 sync blocks, each of said 135 sync blocks having

114 bytes, are continuously disposed on each of said tracks;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 99-byte main data, and 10-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 99-byte outer error correcting code, and the 10-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of the 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

16. A magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, comprising:

formatting means for adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and for formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

supply means for supplying the data formatted by said formatting means to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting means continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 97-byte main data, and 12-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 97-byte outer error correcting code, and the 12-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync

blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of the 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

17. A magnetic tape recording apparatus according to claim 16, wherein the video data is high definition video data compressed by an MP@HL or MP@H-14 method.

18. A magnetic tape recording method for use in a magnetic tape recording apparatus for recording digital data on tracks of a magnetic tape by using a rotary head, said magnetic tape recording method comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said

formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 97-byte main data, and 12-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 97-byte outer error correcting code, and the 12-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of the 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

19. A recording medium for storing a computer readable program which allows a magnetic tape recording apparatus to record digital data on tracks of a magnetic tape by using a rotary head, said computer readable program comprising:

a formatting step of adding error correcting code to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, and formatting said first group data and said second group data so that they are continuously disposed on the tracks of said magnetic tape; and

a supply step of supplying the data formatted in said formatting step to said rotary head so as to record the data on said magnetic tape, wherein:

said formatting step continuously disposes 135 sync blocks on each of said tracks, each of said 135 sync blocks having 114 bytes;

among said 135 sync blocks, 118 sync blocks each consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 97-byte main data, and 12-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the

three-byte identification information, 97-byte outer error correcting code, and the 12-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of the 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.

20. A format of a magnetic tape having tracks on which digital data is recorded by using a rotary head, comprising error correcting code added to each of first group data including video data, audio data, or search data, and second group data including subcode data related to said first group data, said first group data and said second group data being formatted so that they are continuously disposed on the tracks of said magnetic tape, wherein:

135 sync blocks, each of said 135 sync blocks having 114 bytes, are continuously disposed on each of said tracks; among said 135 sync blocks, 118 sync blocks each

consist of a two-byte detection pattern for detecting the sync block, three-byte identification information for identifying the sync block, 97-byte main data, and 12-byte inner error correcting code added to said identification information and said main data, and the remaining 17 sync blocks each consist of the two-byte detection pattern, the three-byte identification information, 97-byte outer error correcting code, and the 12-byte inner error correcting code; and

said outer error correcting code is provided for each group of the 135 sync blocks obtained by dividing 2160 sync blocks contained in sixteen tracks by sixteen planes, or for each group of the 135 sync blocks obtained by dividing 1620 sync blocks contained in twelve tracks by twelve planes, or for each group of 135 sync blocks obtained by dividing 1080 sync blocks contained in eight tracks by eight planes, and said sync blocks are arranged on said magnetic tape so that the distance between the sync blocks belonging to the identical plane is constant among the planes.